



Mr. Bill Honker
Director, Water Division
United States Environmental Protection Agency, Region 6
1445 Ross Avenue, Suite 1200
Dallas, TX 78202

Re: Response by Permittee to EPA regarding additional questions from EPA to TCEQ based on Fish and Wildlife Service Letter of December 22, 2016; Draft TPDES Permit for City of Dripping Springs

Dear Mr. Honker:

This letter contains responses to EPA concerning 9 questions that Mr. Greg Valentine of your staff requested of TCEQ based on a December 22, 2016 letter from the United States Fish and Wildlife Service comment letter to EPA on City of Dripping Springs' draft TPDES permit. Mr. Valentine sent the following request to TCEQ:

"Please provide explanations/information, if not already included in your response to the Interim Objection Letter, dated December 1, 2016, for the following questions generated from the U.S. Fish and Wildlife Service (FWS) letter, dated December 22, 2016."

As Applicant, the City of Dripping Springs (CDS) will provide its responses in an effort to expedite the process and clarify technical issues. Mr. Valentine's questions will be listed first followed by CDS' response.

QUESTION

1. How did you come to the conclusion that the discharge from the above referenced facility (TX0136778) would not further endanger the three federally listed, aquifer-dependent species (Austin Blind Salamander, Barton Springs salamander, and the Comal Springs dryopid beetle) which inhabit the subterranean water-filled conduits of this aquifer and the surface habitat at and near springs?

Please provide all pertinent information in this decision-making.

RESPONSE

The three listed species are essentially dependent on the quality of the water where they live. Permit No. TX0136778 will not impact the quality of the water either in Onion Creek or the Edwards Aquifer. The basic reasons are fourfold: 1. Treatment process and quality of the effluent; 2. Distance to recharge features and even greater distance to habitat areas; 3. Comparably small amount of effluent flow compared to total stream flow and quantity of water in Edwards Aquifer. 4. 2015 Study documents level of Nitrates before there is harm to Salamanders is significantly higher than nitrates in CDS' treated effluent.

Concerning Point No. 1 above, the City of Dripping Springs will utilize a biological nutrient removal process that will allow the facility to meet the stringent permitted effluent parameters. The permitted effluent will be of a very high quality and aimed at requiring low nutrient levels in the effluent. Further, the Dissolved Oxygen (DO) in the effluent must maintain 6.0 milligrams per liter (mg/L). All Water Quality Models that have been run support this premise, including the second WASP Model that the City of Austin provided. That is, the City of Austin's second WASP model indicates that impacts to the creek are limited to a 2-3 mile range downstream of the discharge point. It should be pointed out that City of Dripping Springs believes that both of the City of Austin's models have technical deficiencies and that both models overstate any potential impact to Onion Creek.

On Point No. 2 above, the point of discharge is just under 20 miles from the beginning of the Edwards Aquifer recharge zone. From that point, it is over 18.5 miles, in a straight line, from Onion Creek at the recharge zone to Barton Springs. The great travel distance provides opportunity for additional treatment, evaporation, evapotranspiration and dilution.

On Point No. 3, if the entire 0.995 MGD is actually discharged, that amount would represent a fraction (2.9%) of the annual streamflow that passes through Onion Creek, which has an historical average flow value of 37,118 ac-ft/year. The median streamflow rate measured at the USGS station on Onion Creek near Driftwood is 1.2 cfs. Between the region of the proposed discharge and the recharge zone, Onion Creek gains flow from Trinity Aquifer groundwater, on the order of several cfs. It should also be noted that full discharge of 0.995 MGD will not be reached for many years.

As the discharged effluent moves down Onion Creek, much of the volume would be lost via evaporation and evapotranspiration, much would infiltrate into shallow gravel layers in the streambed, and the remainder would be substantially diluted by the normal baseflow within Onion Creek. A mixture of highly diluted highly treated effluent and Onion Creek baseflow would enter the aquifer along the recharge zone. Then, as water moves toward Barton Springs, it will also encounter recharge from other tributaries. The historical average flows for other contributing streams include Bear Creek at 5,313 ac-ft/yr, Slaughter Creek at 4,083 ac-ft/yr,

Williamson Creek at 3,043 ac-ft/yr, and Barton Creek at 40,851 ac-ft/yr. Once any mixture of effluent and normal baseflow is within the recharged aquifer, it will encounter approximately 300,000 ac-ft (100,000 million gallons) of water stored therein, which will certainly mean that it would be impossible to detect any vestiges of the effluent at the point of discharge from Barton Springs.

Finally, on Point No. 4, CDS would point to a 2015 study where the potential toxicity of nitrogenous compounds to the Barton Springs Salamander was investigated in a laboratory study conducted under the auspices of the FWS and Texas State University (Crow, 2015). In short, the study found that salamanders have a tolerance for nitrates in the water far, far greater than the amount of nitrate in CDS' proposed discharge. In the test, salamanders were exposed to varying concentrations of unionized ammonia, nitrite nitrogen, and nitrate nitrogen in order to determine a lethal concentration at which 50% of the organisms died (LC50). Study results indicated that the LC50 for ammonia nitrogen was 2.1 mg/L, for nitrite nitrogen was 27.2 mg/L, and for nitrate nitrogen was 851.1 mg/L. The typical range of nitrate nitrogen in Barton Springs is approximately 1.0 – 2.0 mg/L, as referenced in the preceding paragraph. The proposed effluent discharge will not raise the baseline concentration by a measurable amount. The baseline nitrate concentration is substantially below the LC50 value determined experimentally. (Crow, J.C. 2015. Effects of Temperature and Nitrogenous Wastes on Survival and Growth of the Barton Springs Salamander *Eurycea sosorum*. Thesis, Texas State University.)

Turning to the Drypoid Beetle in Fern Banks Springs, there is no geologic literature that indicates a connection between the Barton Springs segment of the Edwards Aquifer and Fern Bank Springs. FWS' statement implying that under certain conditions that recharge from Onion Creek may flow to Fern Banks Springs is simply erroneous.

QUESTION

2. How did you come to the conclusion that the discharge from the above referenced facility would not further degrade the designated critical habitat for these species and the underlying Edwards Aquifer?

RESPONSE

This question is answered above. The habitat of the 3 species, as shown in your first question, is water from the Edwards Aquifer. According to the Recovery Plan for the Barton Creek Salamander, protecting the water quality will protect the species. The treated effluent will not adversely impact the quality of the receiving stream, Onion Creek. This is supported by the models and is based on the restrictive permit limits. For further clarification, please see Response to Question 1. Again, concerning the Drypoid Beetle, there is no connection between the proposed discharge route and Fern Bank Springs.

QUESTION

3. Has TCEQ looked into the effects of Onion Creek flowing towards Fern Bank Springs in the San Antonio Segment of the Edwards aquifer? If so, please provide any information obtained during this research. If not, please provide reasoning as to why not.

RESPONSE

Yes, this issue has been reviewed. There is no geologic literature that we can find that supports the argument that water from Onion Creek flows towards Fern Bank Springs in the San Antonio Segment of the Edwards Aquifer. FWS is simply incorrect in their assertion. CDS believes that EPA should request FWS to provide the basis for their statement indicating that such a pathway exists.

QUESTION

4. Have the effects of the potential of having pharmaceuticals and personal use products in the effluent of the above referenced facility been reviewed/studied? If so, please provide all information obtained during this research/review. If not, please provide reasoning as to why not.

RESPONSE

Recent research has indicated that most CECs are removed very well during conventional and advanced wastewater treatment processes. Treatment effectiveness has been shown to be enhanced with processes that feature a longer solids retention time, such as the process proposed by the City of Dripping Springs. (Jeppson, B., E. Steinle-Darling, T. Rauch-Williams, A. Dickey, R. Holland, D. Wrozek. 2016. Direct Aquifer Injection of High Quality Reclaimed Water: A Reclaimed Water Management and CEC Case Study. Proceedings of the Water Environment Federation.) (Benson, R., O.D. Conerly, W. Sander, A.L. Batt, J. S. Boone, E.T. Furlong, S.T. Glassmeyer, D.W. Kolpin, H.E. Mash, K.M. Schenck, J.E. Simmons. 2017. Human Health Screening and Public Health Significance of Contaminants of Emerging Concern Detected in Public Water Supplies. Science of the Total Environment, 579, pg 1643-1648.) (Salveson, A., T. Rauch-Williams, D. Drury, E. Dickenson, J. Drewes, S. Synder, C. Higgins, Vanderford, D. Gerrity, D. McAvoy. 2012. D. Gerrity, D. McAvoy. 2012. Trace Organic Compound Indicator Removal During Conventional Wastewater Treatment. Carollo Engineers, Final Report to Water Environment Research Foundation Project CEC4R08.)

The above fact combined with the distance from the point of discharge to Barton Springs provides additional treatment and dilution where CECs will not impact either of the listed Salamanders.

Finally, although EPA is more familiar with the following than is the City of Dripping Springs, EPA has not yet developed any appropriate criteria for this broad category of constituents. Studies have shown that there is little public health concern for most of the potential

contaminants. With improvements in analytical techniques and capabilities, most of the contaminants are only infrequently encountered in waters and then only at parts per billion or lower concentrations.

QUESTION

5. Has TCEQ taken into account the U.S. Geological Survey's documented increased levels of nitrates in the Barton Springs Segment from non-point sources (Mahler et al. 2011)?

RESPONSE

CDS disagrees that the 2011 above-referenced Study documented increased levels of nitrates in the Barton Springs Segment. The nitrate level at Barton Springs has been stable over an observed range of typically 1.0 – 2.0 mg/L. FWS expresses concern regarding an observation based on a report by Mahler, et al (2011) that nitrate levels may be increasing in the Edwards Aquifer. Despite the fact Mahler's report asserts in the written narrative that nitrate levels are increasing, close inspection of the data within the report indicates that the nitrate level at Barton Springs is in fact stable over an observed range of typically 1.0 – 2.0 mg/L. The report misses the point that from a water quality standpoint, the values of 1.3 mg/L (past median concentration) and 1.6 mg/L (more recent concentration) are essentially the same and within the observed range. The difference in 1.3 mg/L and 1.6 mg/L can be simply explained and attributable to underlying differences in stream hydrology during past and recent sampling. The report even acknowledges that point. Finally, the report fails to examine the mass balance aspects of the nitrate mass within the aquifer, where it is clear that the nitrate concentration is dictated by nitrate concentrations in the higher streamflow conditions across the recharge zone.

Further, as discussed, the City of Dripping Springs' biological nutrient removal plant will remove nitrogen from the waste stream. Even the City of Austin's model acknowledges that nutrients, including nitrogen, will have limited impact.

Concerning your statement about nonpoint source pollution, such a question is not relevant in considering a point source discharge. Notwithstanding the relevance issue, the City of Dripping Springs takes the issue of nonpoint source runoff seriously. The City of Dripping Springs is a leader in requiring nonpoint source controls for new development, and new developments are limited to 10% impervious cover by ordinance for areas located on the recharge zone. New developments that use surface water from Lake Travis are required to design their land plans in conformance with either Enhanced Optional Measures in the TCEQ's Edwards Aquifer rules or have their land plans reviewed and approved through the FWS office. In short, the City of Dripping Springs ensures, as much as possible, that the new development does not increase nonpoint source pollutants.

QUESTION

6. Has TCEQ taken into account the significant percentage of Onion Creek channel flow loss into their estimated effect this discharge will have on the aquifer and the endangered species (listed above in Question 1) that depend on the subterranean water-filled conduits? If so, please explain.

RESPONSE

This question is essentially a different way of asking the same question as was in Question 1. Nonetheless, the City of Dripping Springs has examined this issue as has been showed in the responses to Questions 1 and 2. As explained, the total amount of flow from the City of Dripping Springs wastewater treatment plant, assuming full discharge every day, is still but a fraction of the total amount of water in Onion Creek and even much smaller fraction of the water in the Edwards Aquifer. As also previously discussed, the treated effluent is of high quality and will not adversely impact the receiving streams.

QUESTION

7. Has carefully planned land application disposal and/or moving the outfall to a less sensitive location been taken into consideration? If so, please provide all relevant information obtained during this review. If not, please explain why.

RESPONSE

Whether the City of Dripping Springs has considered alternative methods of wastewater disposal is not relevant to the issues at hand. Further, the City of Dripping Springs disputes the characterization of the proposed discharge point as being "sensitive". Instead, the City of Dripping Springs is confident that the treated effluent will meet all required limits and requirements.

However, since EPA posed the question, the City of Dripping Springs spent considerable time and resources in determining the proper and best method of wastewater treatment and disposal. The wastewater permit is but one part of the City of Dripping Springs' strategy. Other components include the TCEQ's Beneficial Reuse program and Direct Potable Reuse (DPR) for drinking water. Concerning Beneficial Reuse, the City of Dripping Springs plans to use the treated effluent to irrigate city owned property such as open space, parks, rights of way, etc. Several potential and existing developments have also expressed interest in the treated effluent.

As a growing municipality, the City of Dripping Springs cannot depend solely on a "no-discharge" permit. The cost of providing the required storage combined with the cost of providing the required effluent irrigation facilities would essentially negate the ability to engage in beneficial reuse of wastewater. Simply put, a municipality that is growing and with more growth forecast, that municipality must be able to handle the wastewater flow. It is unsound

policy for such a municipality to rely on no-discharge, which requires massive amounts of land and cost to provide the irrigation. Furthermore, subsurface drip irrigation is not a realistic option in this part of Central Texas due to soil conditions and the extreme high costs due to the soil conditions.

On the other hand, a discharge permit allows the City of Dripping Springs the flexibility to reuse the treated effluent in a beneficial manner. This reuse has the added benefit of conserving groundwater or potable surface that would otherwise be used for irrigating open space, parks, etc. Further, with a discharge permit, the City of Dripping Springs is not required to expend public funds on lined ponds that will generally not be in use since most or all of the treated effluent will be used for beneficial reuse or DPR.

Unfortunately, the permitting requirements are such that the applicant, here the City of Dripping Springs, must prove that it will not adversely impact the receiving stream at full permitted limits at low stream flow.

QUESTION

8. I seem to remember seeing somewhere, that during slow flow times the facility won't discharge to Walnut Springs Creek and then to Onion Creek, but will rather discharge to subsurface irrigation, as is/has been the practice at this location. I can't find this language, could you please provide it, or correct me if I am incorrect on this? Also, what is the definition of low flow times? What is the threshold where effluent will be discharged to the Creeks instead of subsurface?

RESPONSE

The above statement is not correct. The City of Dripping Springs draft permit does not have a requirement on when it may discharge. Instead, the emphasis has been finding the proper effluent set that does not adversely impact the receiving stream under low flow conditions. These limits are reflected in the draft permit. In short, the TCEQ lowered the phosphorus and ammonia nitrogen and raised the DO requirement.

While it is not required, the City of Dripping Springs has been open and very clear that it plans to take advantage of the TCEQ's Beneficial Reuse rules and use the treated effluent to irrigate parks, open space and other such areas. The City of Dripping Springs also has invested considerable resources in using this treated effluent as drinking water. Of course, before being able to be used for drinking water, the treated effluent would require further treatment.

QUESTION

9. If I was correct on Number 8, above, what percentage of time will the discharge be via the outfall to the Creeks? To subsurface irrigation?

RESPONSE

Not Applicable

Once again, CDS would like to meet with you to discuss these issues in more detail. This project is of utmost importance to the City of Dripping Springs for a number of reasons, not the least of which is that the permit is necessary to meet wastewater demand.

Very truly yours,



Andrew N. Barrett